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SOUTHEASTERN UTAH: A STUDY OF AN ARID REGION

By MALCOLM RUTHERFORD THORPE
Yale University

Examination of population maps of the United States, as, for example, the map showing distribution of rural population in the Statistical Atlas of the United States (1914), Jefferson's Cities map of the United States,[1] and a variety of agricultural maps such as one showing percentage of land in farms, reveals a pronounced difference between west and east in occupation of the land. The dividing line comes at about the one-hundredth meridian. East of this line are to be found the majority of our cities, a comparatively dense rural population, and a considerable proportion of the land under cultivation; west of the line are few cities, a scant population, and much untouched land. Comparison with a rainfall map shows coincidence of this line with the isohyet of 20 inches. A similar coincidence is seen for the greater part of the division between the interior and the Pacific slope regions.

CHARACTERISTICS OF THE ARID REGION

Twenty inches of rainfall is a quantity critical in agriculture in the mid-latitudes of the United States. Broadly speaking, a rainfall of over 20 inches means agriculture without irrigation and hence the possibility of a wide occupation of the land with farms, towns, and cities. A rainfall distinctly under 20 inches

[1]Map showing all cities of United States with a population of 1,000 and over (1910), 1:15,000,000, accompanying the article "Some Considerations on the Geographical Provinces of the United States," by Mark Jefferson, *Annals Assoc. Amer. Geogrs.*, Vol. 7, 1917, pp. 3-15.

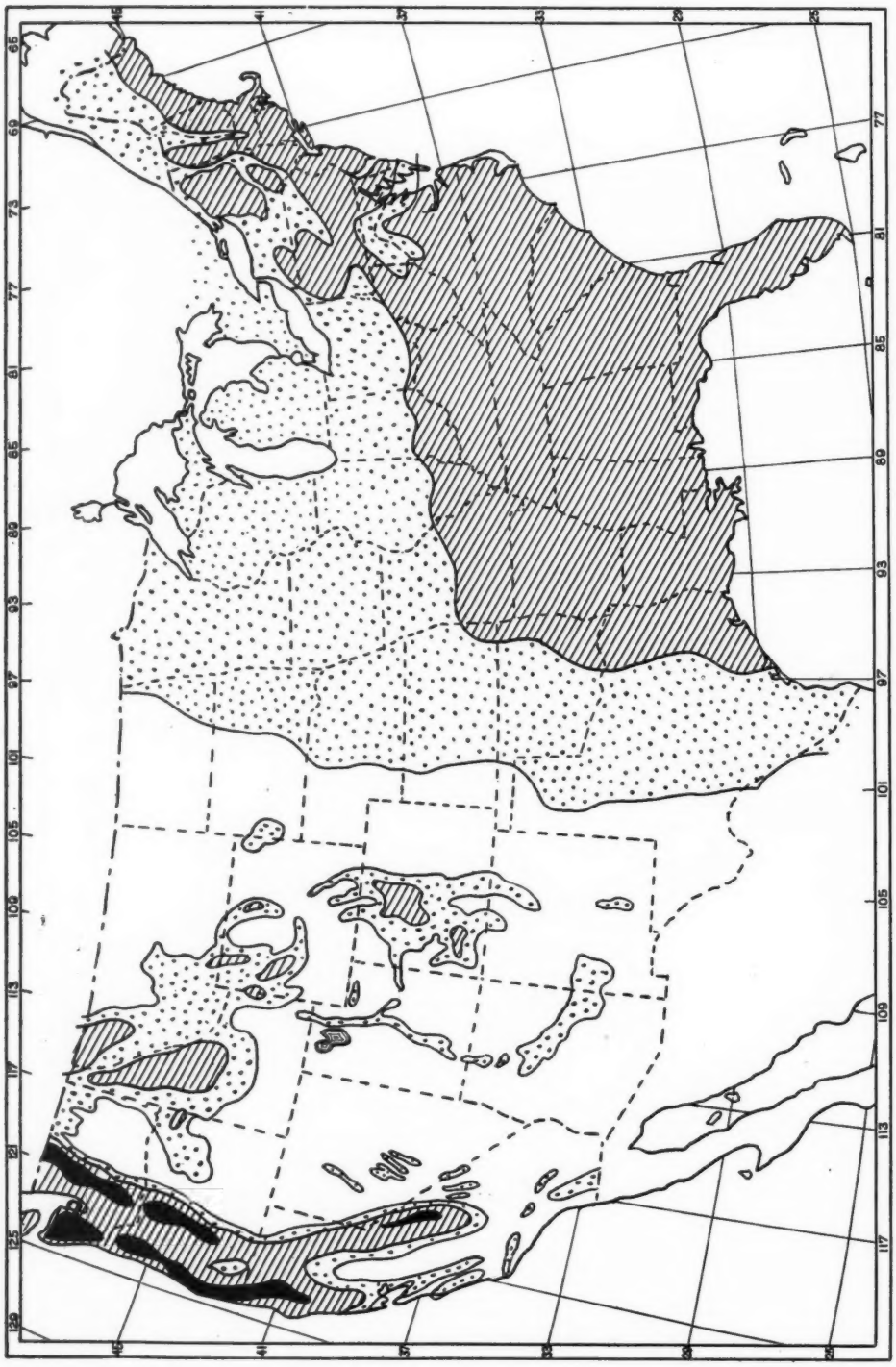

FIG. 1—Humid and arid regions of the United States. Scale, 1:25,000,000. Humid regions are shaded. Black indicates excessive rainfall (over 80 inches a year); ruled lines abundant rainfall (40-80 inches a year); dots sufficient rainfall (20-40 inches a year). Unshaded areas (under 20 inches a year) are arid or semi-arid: agriculture is only possible where dry farming or irrigation can be employed. Note the dividing line between humid east and arid west about the one-hundredth meridian. (Map by Mark Jefferson.)

means semiarid or arid conditions and agriculture only with irrigation or dry farming. Occupation of the land is sharply localized: there are likely to be limited areas of comparatively high population and vast stretches of land that is empty and as far as we can see must remain so. The state of Utah, in the heart of our arid belt, affords a good example of this localization: the accompanying map shows the string of "oasis" towns. Over the greater part of the rest of the state the population is less than two to the square mile. The irrigated areas may be increased; in some sections dry farming may be extended, but empty spaces will remain. The present article will discuss some of the geographical characteristics of such a region in some detail, selecting for this purpose the southeastern corner of Utah, San Juan County.

SAN JUAN COUNTY

San Juan County, covering an area of 8,029 square miles, is larger than the state of New Jersey; but, where New Jersey has a population of about 2,000,000 (at the 1910 census 337.7 per square mile), that of San Juan County is only 2,500 (see location map, Fig. 8). This population is largely concentrated in four settlements. Monticello, the county seat, has 750 people; Grayson, 600 people; La Sal, 150 people. Bluff, on the San Juan River, has 300 people. Though deficient in population, the San Juan region is filled with natural and prehistoric marvels—gigantic natural bridges and extensive ruins of cliff dwellings—and boasts a remarkable type of scenery.

A CANYON-CUT PLATEAU

The county is a typical part of the physiographic province known as the Colorado Plateaus. Broad expanses of plateau surface are broken to a diversified relief by the extraordinarily deep-cut canyons, while a further element of relief is contributed by the occurrence of lofty domed mountains of laccolithic origin. In San Juan County two mountain masses, the Abajo Mountains, near the center of the county, and Navajo Mountain, in the southwestern corner, rise abruptly from the plain surface and stand out as "igneous islands in a sedimentary sea." Navajo Mountain has an altitude of 10,416 feet; the culminating height of the

year); ruled lines abundant rainfall (40-80 inches a year); dots sufficient rainfall (20-40 inches a year). Unshaded areas (under 20 inches a year) are arid or semi-arid: agriculture is only possible where dry farming or irrigation can be employed. Note the dividing line between humid east and arid west about the one-hundredth meridian. (Map by Mark Jefferson.)

Abajo Mountains is 11,445 feet above sea level, while the average altitude of the plateau is between 6,500 and 7,000 feet.

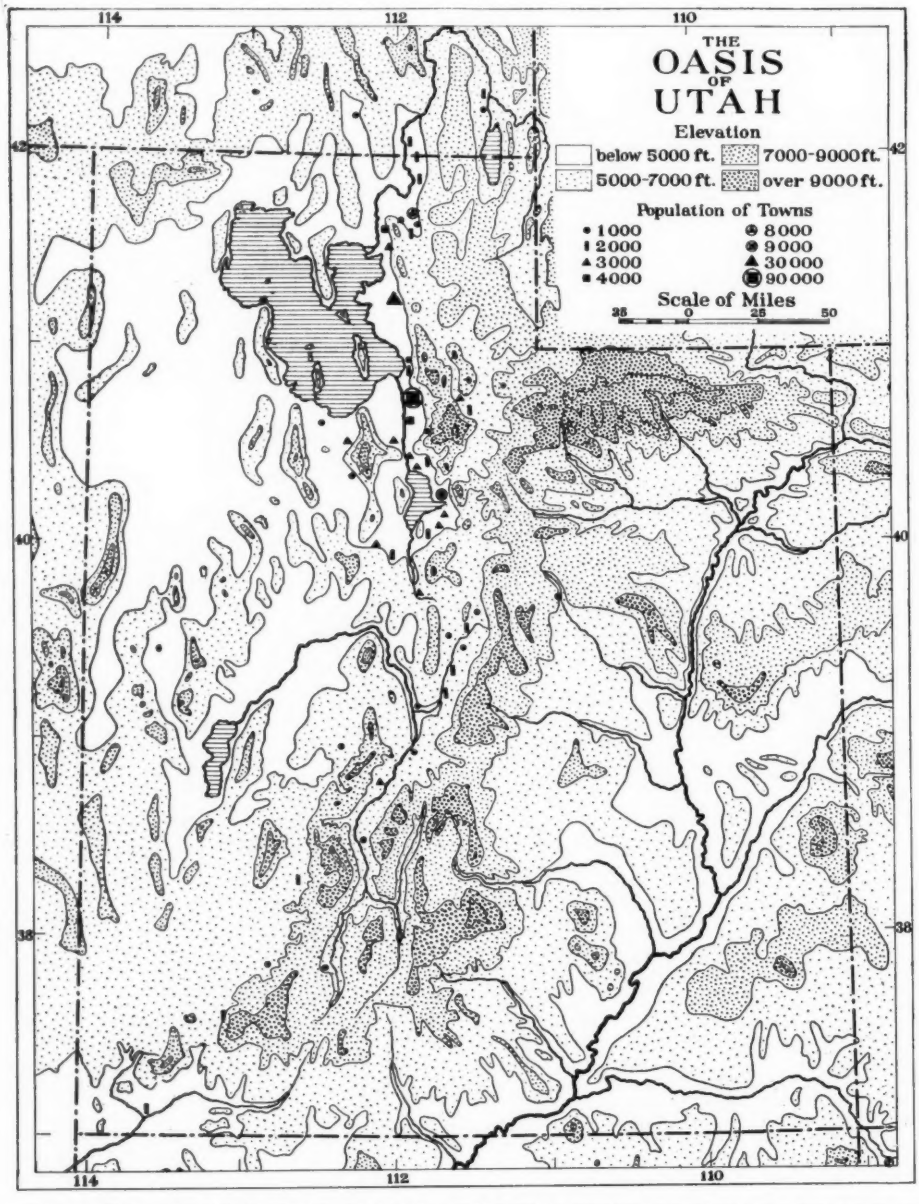

FIG. 2—The oasis of Utah. Scale, 1:4,300,000. Settlement is practically confined to a belt 350 miles long and 50 miles wide along the western base of the Wasatch Mountains. Compare with map of the irrigated lands, Fig. 9. (Map by Mark Jefferson.)

Between the Abajo Mountains and the San Juan Mountains in Colorado lies the Great Sage Plain. This is a nearly level

expanse, covered by sagebrush and intrenched by deep canyons. The northern part of the county is carved into innumerable canyons in Dry Valley, where vertical cliffs of sandstone show vivid colorings—brilliant reds and yellows merging into buffs and narrow bands of bright green shale, extending for long distances without interruption. Here are many isolated buttes. The western section is desolate, deeply incised by canyons, and covered with sagebrush up to the line of tall cliffs that border the entire western boundary of the county along the Colorado and Grand Rivers. Three of the largest natural bridges in the world are in White Canyon. They have been constituted a National Monument. Numerous extensive cliff dwellings in various degrees of preservation are also found in niches along the walls of this canyon. The southern section of the county is likewise a plateau surface cut by deep canyons. These are tributary to the San Juan River, which joins the Colorado near the western corner of the area. At the western base of Navajo Mountain is the largest natural bridge in the world, the famous Rainbow Bridge, called Nonnezoche (Great Arch) by the Navajo Indians.

Aridity has placed its mark upon the topography of this area. Buttes, mesas, canyons, and long lines of cliffs, as well as the level expanses, are all results of long prevalent arid conditions. The absence of vegetation gives the torrential rains and high winds free scope in cutting, etching, and removing the softer strata, leaving the more resistant layers as capping for buttes, mesas, and plateaus.

THE CLIMATE: VARIABILITY ITS KEYNOTE

Over this area high atmospheric pressure and consequent aridity are prevalent; the usual movement of air is downward and outward. In summer the whole continental interior becomes highly heated, and low barometric pressure prevails. This induces an inward draft from the southwest, blowing from the Pacific Ocean, the Gulf of California, and the Gulf of Mexico. In this province two wet seasons occur: one in winter, deriving its moisture from westerly winds, and one in summer (July, August, and September), deriving its moisture from the southwest winds. The summer storms take the form of thundershowers

during which the rainfall is torrential and the lightning almost incessant, causing considerable damage in some exposed localities.

The actual amount of the rainfall is determined by the relief and exposure. La Sal, at the foot of the La Sal Mountains, and Monticello, at the foot of the Abajo Mountains, both at an elevation of 7,000 feet, have annual rainfalls of 10 inches and 19 inches respectively. Aneth, on a terrace overlooking the San Juan River (elevation 4,700 feet), has a rainfall of 5.45 inches, and Hite, in

FIG. 3—Rainbow Natural Bridge, an example of eccentric stream erosion at the foot of Navajo Mountain. The bridge was first seen by white men in 1909. Its span measures 278 feet; height of the arch above the stream 309 feet. (Photograph by H. E. Gregory.)

the canyon of the Colorado river (elevation 3,500 feet), of 6.92 inches.

The highest temperature recorded at Hite is 115° and the lowest 2°; at Aneth the extreme range is 106° to —10°. Daily ranges are also very great in this region, where the skies are prevailingly clear and the atmosphere is dry.

The keynote to the climate as a whole is variability, not only between the northern and southern sections, lowland and highland, opposite sides of mountains and mesas, rim and floor of a canyon, but even between opposite sides of the same canyon. The heat of

midsummer is intense, although the edge of a shadow marks the difference between heat and pleasurable coolness.

THE VEGETATION: FOREST ISLANDS IN THE SAGE PLAIN

The vegetation reflects the rainfall conditions. The greater part of the region is covered by an open shrub formation where

FIG. 4—An example of erosion in an arid region: butte in Monument Valley, Utah. The sandstone column, about 200 feet high, rests on a shale pedestal about 300 feet high. (Photograph by H. E. Gregory.)

the characteristic plant is the grayish green sagebrush, while grasses and succulent plants are almost entirely lacking. The greater humidity of the mountains brings in other types of vegetation. A survey of the vegetation of the Abajo Mountains is instructive. The northern and western slopes, cooler and rainier,

are forested, while the eastern and southern slopes are covered with mountain grasses.

Taking the Abajo Mountains as a whole seven vegetation types are recognized, according to the principal tree species or the character of vegetation peculiar to certain conditions, as follows:

1. Yellow pine (*Pinus ponderosa*). This type is characteristic of all high plateaus—elevations of 6,700 to 9,000 feet—and covers approximately 56,500 acres on the Abajo Mountains. The average maximum diameter of these trees is three feet, and the average total height 70 feet. These trees grow to a great age, and some in this area are between 500 and 600 years old. The annual precipitation over the area occupied by this type is 20 inches.

2. Mixed type (Spruce-balsam). This type is limited to the high rugged mountainous areas between 7,500 and 11,500 feet in height, where it gets a larger amount of moisture, both from the soil and from the air, than over the plateau and mesa formations. These trees vary in height from a stunted, scrubby alpine type of 15 to 20 feet to 120 feet or more. The ground cover consists of bunch grass and brush and, in denser parts, of stunted reproduction—dwarf juniper, willows, and alders.

3. A woodland type, consisting predominantly of piñon pine and Utah juniper, covers about 25 per cent of the area on the Abajo Mountains. The zone lies between 5,000 and 8,000 feet elevation and extends farther up the southern than the northern slopes. Piñon pine usually grows on benches and flats at high altitudes.

4. The brushland type covers about 56 per cent of the total area of this region. It grows regardless of altitude, soil, or exposure, except under fairly dense stands of tree growth. Oak and service berry are the most prominent.

5. The sagebrush type rarely grows above 9,000 feet, except on the plateau country, where it is found almost exclusively over considerable areas.

6. Grassland or mountain-meadow type. The range of this type is between 7,600 and 11,000 feet, and it occupies less than one per cent of the area.

A

B

C

FIG. 5—Vegetation conditions in the Abajo Mountains. The cooler and rainier northern slopes are forested; the drier and warmer southern slopes are grass covered. Both slopes are shown in A. In B is shown a grassed southern slope; in C a heavily forested northern slope.

7. Barren areas are formed of slide-rock masses on the higher slopes of the peaks. Lichens and alpine grasses form the only vegetation of these areas.

On the solitary Navajo Mountain the forest zones appear as well-defined belts—over 8,500 feet, spruce; 7,000 to 8,000 feet, yellow pine; 6,000 to 7,000 feet, piñon and juniper.

The forested areas of Navajo Mountain, the Abajo, and La Sal Mountains apart, the region is typical dry sagebrush land supporting only a restricted animal life of which certain small game and the jack rabbit are the most numerous members.

FIG. 6—Cliffs of the Colorado. Dandy Crossing at Hite, Utah.

THE ARID REGION AS THE HOME OF MAN

What of human occupation? The arid regions of the earth present two possibilities as the home of man: there may be the sharply localized and fixed settlement of the oasis type or the wide occupation of nomadism. From long past both types have been represented in the area under discussion. A portion of southern Utah falls within what is known as the Pueblo Country, from the character of the settlements made by the sedentary Indian inhabitants. In San Juan County remains of these settlements are seen in the cliff dwellings.

The natural caves and recesses weathered in the canyon sides afforded man ready-made shelter. They were used by the Indians as residences, burial grounds, storerooms, and for hiding and defense, and the simple natural forms were often elaborated and improved. Marginal walls would be built along the rock ledge for protection, enlargement of the rooms effected by excavating if the formation would permit of it, and large cavities of consider-

able areal extent dug out of the cliff. In size the cliff dwellings range from mere horizontal crevices or isolated niches to very extensive chambers, sometimes consisting of more than one story

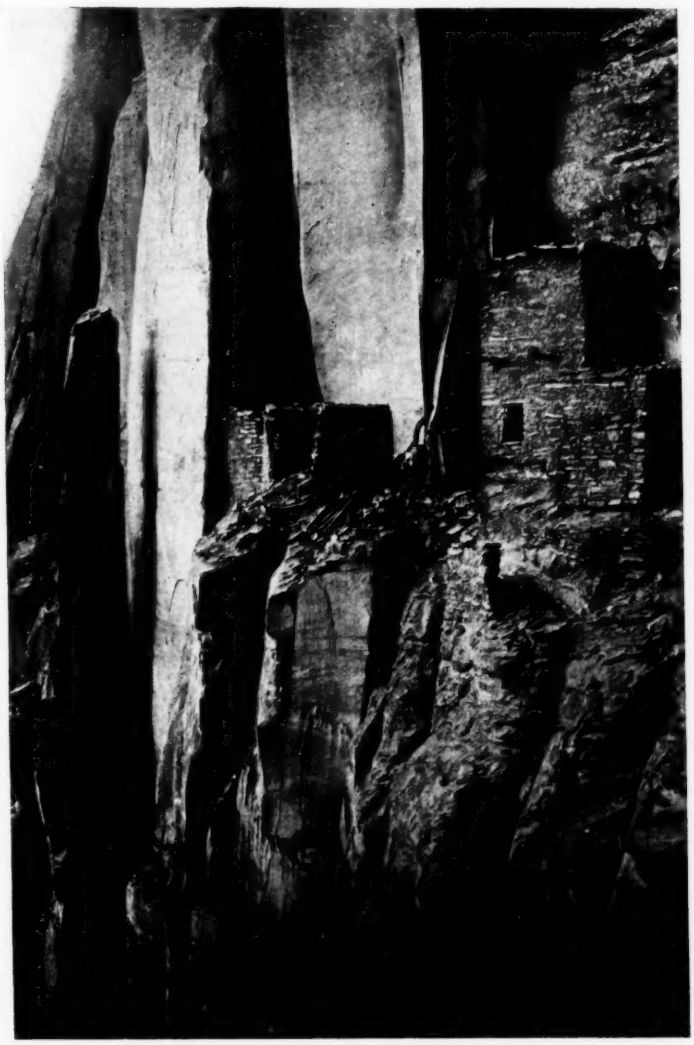

FIG. 7—A cliff dwelling in Tsegi Canyon, a southern tributary of the San Juan River. (Photograph by A. H. Townsend.)

and being capable of accommodating whole communities. Most of the sites were approached from below, rarely from above; and, if the way were very steep, niches would be cut into the cliff face or notched log ladders used. The tribes occupying these dwellings, suspended as it were between plateau surface and canyon floor,

cultivated the fields either above or below them. By means of dry farming or flood irrigation they raised such crops as corn, beans, melons; their laborious and careful cultivation being a type that might properly be described as horticulture.

A Cliff Dwelling

The writer has examined in detail a small dwelling in Bulldog Canyon, south of the Abajo Mountains. It is located 70 feet above the floor of the canyon in a re-entrant in the sandstone of the cliff. It has one room and a granary. The roof is the solid rock of the cliff and slopes back so that in the rear it is hardly more than two feet above the floor. The front of the structure is a wall of masonry, a foot and a half thick, made of rocks held together by adobe brought from the creek bed below. This wall, very well built, has withstood the weather in a remarkable manner. The interior of the wall is cemented smooth. The main room, 20 feet long and 10 or 12 feet wide, has one aperture, 18 by 30 inches, about one foot above the floor, which was closed by a flat stone of exact size to fit it. The lintel is a flat slab supported by a wooden rod, while the sill is also a flat stone. The granary is approximately 10 feet long, 5 feet wide, and 5 feet high. It has an opening, larger than the one into the house proper, but with no sill. There is no interior connection between granary and living room. Many small corn cobs were found in the granary, and a few pieces of pottery and charcoal in the main room. On the exterior wall of the granary are wooden handholds showing by what means the inhabitants reached their lofty retreat. The comparative importance of the granary should be noted. Food storage against the lean years of famine was imperative. Among the Pueblo Indians the large granary is as significant of the arid environment as is the importance attached to rain-inducing ceremonies.

Nomad Tribes

The northern section of the Pueblo Country, including the strip of Utah south of the San Juan River, is now created into an Indian reservation occupied by the Hopi and other sedentary peoples, as well as by the nomad Navajo and Piute. The nomad tribes settled the problem of life in an arid region in a mode entirely

different from that of the Pueblo peoples. They are hunters and herdsmen moving from place to place in search of water and forage. Their homes are temporary structures of poles and mud or of brush. Of late years, however, as civilization has moved westward, the wanderers tend to make permanent homes and prac-

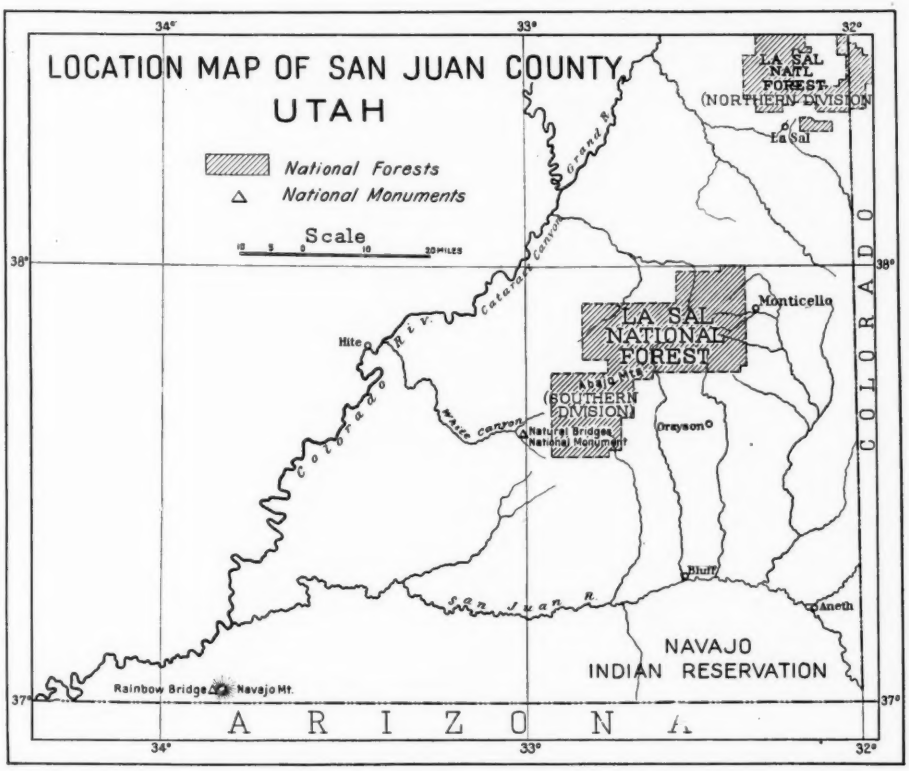

FIG. 8—Location Map of San Juan County, Utah. Scale, 1:1,950,000. Longitude is west of Washington: add 77° for longitude west of Greenwich.

tice agriculture more extensively. A few bands of Navajos roam into San Juan County, but most of the Indians of the county are Piutes. They form nearly half the total population.

The Piute Reservation is in the southwestern part of the county, west of the 110th Greenwich meridian; but some families live in Allan Canyon, south of the Abajo Mountains. They are lazy and depend for a living largely upon begging from the whites, although they carry on some agriculture and raise sheep and ponies of inferior stock.

The White Settlers

A twofold adaptation, similar to that of the Indians, is seen in the white settler's occupation of San Juan County. The chief occupation is ranching. Cattle, horses, and sheep are raised in large numbers. The summer range for stock is the uplands, as the Abajo Mountains, where pasturage and water are plentiful; in winter the stock is driven into the canyons where it is warm. For the season of 1915 the Secretary of Agriculture authorized the grazing of 19,000 head of cattle and horses and 20,000 head of sheep on three districts of the Monticello Division of the La Sal National Forest. The stock is driven overland to Dolores, Colorado, and from thence is shipped to the packing centers.

Before passing to the second type of occupation it may be remarked that mining—so important in the opening up of much of the arid interior of our country—here plays an inconsiderable part. Prospecting and mining have in the past attracted more attention than at present. This activity is now dormant, except in the carnotite producing areas at or near the base of the La Sal Mountains, in Grand County, and in Dry Valley, where continuous work has been carried on for several years.

Following the agricultural principles worked out long ago by the Pueblo Indians the white farmer practices agriculture by irrigation and dry farming.

Dry Farming

Dry farming is a form of agriculture by which crops are raised in sections where moisture is the limiting factor in crop production: it is essentially based on the conservation of moisture. Success in dry farming depends upon preparation of the soil so that the largest possible proportion of rainfall will be absorbed and the least possible amount of this moisture be lost by evaporation. In breaking up new land a certain period of time must elapse between plowing and seeding to allow the soil to accumulate moisture. Deep plowing is necessary, and the land should lie fallow every other year so that the soil will store up enough moisture to bring the next season's crops to maturity. During the fallow period the land must be kept free from weeds and all other kinds of vegetation, as they would use up the stored water.

Thorough mulching of the surface soil and frequent harrowing to destroy weeds and to keep the surface in a loose condition, especially after heavy rains, must be done. In addition, hardy strains of drought-resisting varities of seeds must be sown. The

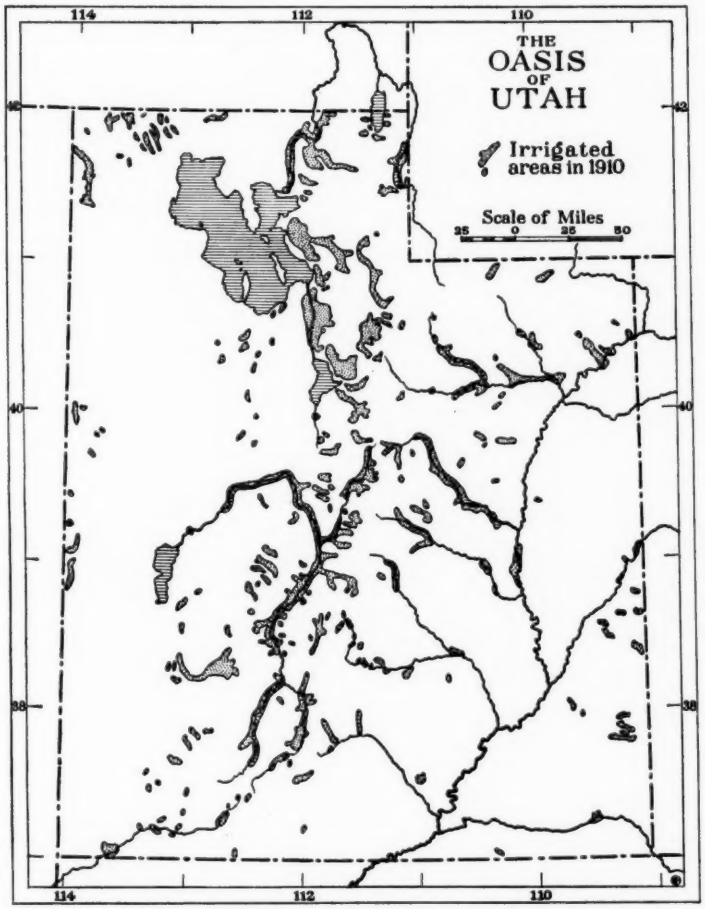

FIG. 9—The irrigated lands of Utah in 1910. Scale, 1:5,670,000. Based on Fig. 2, Pl. 404, Statistical Atlas of the United States, Bureau of the Census, 1914. (Map by Mark Jefferson.)

cost of making land productive is from $4 to $10 per acre for dry farm land and the same for irrigated land, plus the water rights and laterals.

At present in San Juan County there are about 9,000 acres of irrigated land under cultivation and 7,000 of dry farm land. There are in all approximately a million acres of agricultural land, and less than one-quarter of it is now appropriated. Dry farming

holds out good prospects for the future, for on the Great Sage Plain there are considerable areas of good soil which may be thus converted from barren wastes into gardens.

FUTURE DEVELOPMENT

Development of the county, however, is dependent on the enterprise of its people. One thing urgently needed is a permanent pure water supply, as well as sufficient water for producing electric light and power. The government should also increase the public range for stock grazing.

The region, too, must be made more accessible. At present access is from the north, or east from Colorado, the nearest points where the Denver and Rio Grande Railroad approaches the area. A route has been surveyed for a branch of the Denver and Rio Grande Railroad into Monticello, and it was found that at no place was there a grade too steep for any reasonable load and that no extensive cuts or fills would have to be made.

STATUS OF GEOGRAPHY IN NORMAL SCHOOLS OF THE FAR WEST

By CLYDE E. COOPER
State Normal School, Cheney, Washington

To a specialist in geography it would seem that his subject needs no defense as to its importance in our school curriculum. It ought, moreover, to be apparent to school executives that the trend of modern thought and action is leading directly into fields where a knowledge of geography is indispensable. Yet when one considers the little stress that is placed upon geography throughout the schools of our country, from graded school to normal school and college, it becomes evident that teachers, superintendents, and even those high in authority in matters of education are not fully awake, if indeed they are awake at all, to the vital importance of the subject.

Name of School	Total number of courses	Required Courses					Elect		
		Number of courses	Hours per week	Weeks in year	Total hours per year	Content or Method	Number of courses	Hours per week	W
Arcata, Cal.....	3	3	1. 5 2. 5 3. 5	1. 45 2. 45 3. 36	1. 225 2. 225 3. 180 630	1/3 Method 2/3 Content	..	...	
Bellingham, Wash..	5	..	...	...	....	....	5	1. 4 2. 4 3. 4 4. 4 5. 4	
Cheney, Wash.....	7	2	1. 5 2. 2	1. 48 2. 24	240 48 288	Content Method	5	1. 3 2. 3 3. 3 4. 3 5. 3	
Chico, Cal.....	5	3	1. 3 2. 2½ 3. 2½	1. 36 2. 36 3. 36	108 108 108 324	Method " "	2	1. 5 2. 5	
Dillon, Mont.....	3	1	5	12	60	Method	2	1. 5 2. 5	
Ellensburg, Wash...	1	1	2	?	?	....	..	...	
Flagstaff, Ariz.....	6	3	1. 7 2. 7 3. 5	1. 18 2. 18 3. 18	126 126 90 342	2/3 Method 1/3 Content	3	1. 7 2. 5 3. 5	
Fresno, Cal.....	2	2	1. 5 2. 5	1. 12 2. 6	60 30 90	Content Method	..	...	
Gunnison, Colo.....	1	1	5	12	60	Method	..	...	
Las Vegas, N. Mex..	1	..	...	...	....	....	1	5	
Lewiston, Idaho....	1	..	...	...	....	....	1	5	
Los Angeles, Cal....	13	2	1. 3 2. 3	1. 48 2. 12	144 36 180	Content "	11	1. 2 2. 2 3. 2 4. 2 5. 2 6. 2 7. 2 8. 2 9. 2 10. 2 11. 2	
Monmouth, Ore.....	1	1	5	40	200	Both	..	...	
Reno, Nev.....	1	1	2	16	32	Method	..	...	
Salt Lake City, Utah.	2	1	5	9	45	Method	1	5	
San Diego, Cal.....	6	2	1. 5 2. 1	1. 12 2. 48	60 48 108	Content Method	4	1. 5 2. 5 3. 5 4. 2	
San Francisco, Cal..	3	3	Varying		....	Method	..	...	
San Jose, Cal.....	3	2	1. 5 2. 5	1. 12 2. 12	60 60 120	Content "	1	5	
Tempe, Ariz.....	2	1	5	20	100	Method	1	5	

Elective Courses					All Courses	Head Teacher	Number of Teachers
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5	1. 4 2. 4 3. 4 4. 4 5. 4	48 48 36 24 24	192 192 144 96 96 720	Content " " "	720	Thos. F. Hunt	1
5	1. 3 2. 3 3. 3 4. 3 5. 3	1. 12 2. 12 3. 24 4. 12 5. 24	36 36 72 36 72 252	Content " " "	540	Clyde E. Cooper	2
2	1. 5 2. 5	1. 36 2. 36	180 180 360	Content "	684	C. K. Studley	1
2	1. 5 2. 5	1. 12 2. 12	60 60 120	Content "	180	J. F. McBain	1
..	...	..	....	...	...	Selden Smyson	1
3	1. 7 2. 5 3. 5	1. 36 2. 18 3. 18	252 90 90 432	Content " "	774	J. E. Bentel	2
..	...	..	....	...	90	Marian Powell	1
..	...	..	....	...	60	Mrs. Kellapheme Morrison	1
1	5	18	90	Content	90	Victoria G. Miller	1
1	5	18	90	Method	90	Chas. F. Cheesman	1
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..	...	..	....	...	200	L. P. Gilmore	1
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4	1. 5 2. 5 3. 5 4. 2	12 12 12 12	60 60 60 24 204	Both " " Content	312	Vinnie B. Clark	1
..	...	..	....	...	...	L. Mohr	2
1	5	12	60	Method	180	Mrs. M. W. George	2
1	5	20	100	Content	200	F. W. Hiatt	1

METHOD OF THE SURVEY

Believing that throughout the normal schools of the country geography does not receive the emphasis it deserves, which fact consequently causes the subject to be slighted in our common schools, the writer has gathered the data shown in the accompanying table concerning the present status of the subject in the normal schools of the extreme West. It is hoped that the findings will be of interest and help to normal school teachers, high school principals, and others interested in geography, who may wish to know what other schools are doing. The writer has undertaken this survey with the further hope that it may have some influence in increasing the amount of emphasis to be laid upon geography in the future. No argument will be attempted here on the importance of the subject, because no wide-awake educator can fail to see the necessity of a knowledge of geography in the pressure of our increasing world relations.

The plan followed in assembling the information was this. Letters were sent to the various instructors in geography in the normal schools of the extreme West; and in so far as possible the data so gathered appear upon the accompanying chart. It is obvious, however, that some of the information, such as the nature of the courses, etc., could not be here presented. Since nearly every questionnaire was returned with a personal letter, it is clear that normal school principals and teachers are beginning to take an interest in geography and that the West at least is waking up to the great and increasing value of the subject.

IDEAL PLAN FOR NORMAL GEOGRAPHY WORK

By a study of this table it becomes apparent that there is at present no agreement among the western normal schools as to the amount of emphasis geography should receive nor upon which part of it the emphasis should lie. Some schools seem to be much interested in geography, while others are seriously slighting it. It appears from the chart that the most successful and useful combination is to require enough work in geography to furnish all students with an adequate preparation for teaching and, in addition, to offer enough electives so that any student having a particular interest in the subject can specialize. Such specialization

is of course only possible in three-year and four-year schools; but, since our normal schools are rapidly becoming teachers' colleges, we may rightfully look to them for the future training of our teachers of geography. Most universities are interested in the more technical phases of geology, which are of little use to the teacher in our common schools. It would seem only just, then, that every teacher should have a year of geography in her normal school course before she is certificated; but we need the specialization also because of the departmental work that is opening in the junior high school. If teachers of geography are not on their guard, this work will be turned over to science teachers, who will eliminate the human side of geography altogether.

EXPLANATION OF THE CHART

Column 1 gives the names of the schools which offer geography of college grade. There are 23 normal schools in the states that are strictly Western. Wyoming and Utah have no normal schools but are giving courses for teachers in connection with their state universities. The school at Greeley, Colorado, is classed not as a normal school but as a college and is called the Colorado State Teachers' College. A report of its work in geography is not included in this survey. No report was received from the school at Albion, Idaho. An effort is being made to remove that school to Pocatello, and it is probably safe to assume that it is not giving more time to geography than other schools which appear upon the chart. El Rito, New Mexico, is not giving normal school work in geography at present, nor is Laramie, Wyoming, nor Santa Barbara, California—the last school mentioned being a manual arts school. Several other normal schools are about to be started or provided for by the state legislatures but as yet afford no data concerning prospective courses. The chart, therefore, shows a total of 19 schools attempting work in geography.

Column 2 states the total number of courses offered by each school and may be interpreted as meaning that the schools which stand highest in this column offer the best opportunity for specialization in the subject of geography. The two leaders stand at thirteen and seven, and it is safe to say that this is more geography than many of our universities are giving. As has been stated,

in higher institutions geography is too often subordinated to geology. A study of university catalogues shows that geography, when offered, generally comes under a department called either the Department of Geology or the Department of Geology and Geography. Without a doubt the future will see our leading universities establishing independent departments of geography.

Column 3 gives the number of required courses in the different institutions. The schools which rank first in this column are evidently giving the best training to every student they graduate. They seem to be aiming at the adequate training of every teacher rather than at specialization. Three normal schools require every student to teach a certain number of hours of geography in the training school before graduation. This is undoubtedly an excellent idea if the teaching can be done without slighting other subjects.

Column 4 states the number of hours devoted to each required course per week. The first figures appearing in the column are the numbers of the courses. On the average it appears that the required courses occupy five hours a week. It would seem that nothing less would be at all adequate. An hour usually means 45 minutes in normal schools.

Column 5 gives the number of weeks the course is offered in the year. Evidently the number of weeks depends upon the enrollment. In some places it would be necessary to repeat the course each quarter or semester. Some of the schools are on the four-quarter basis, while others are not. The length of the term seems to vary from ten to eighteen weeks. Also it would be necessary to offer required courses frequently in order that conflicts might be avoided.

Column 6 states the total hours per year devoted to required courses. Evidently the total depends upon the number of times the course is repeated throughout the year rather than upon the number of required courses given. The column may, consequently, show a comparison of the enrollment at various schools.

Column 7 shows where the emphasis is placed and should be especially suggestive. It will be noticed that the division is almost equal but that it inclines a little toward methods. In the personal letters received it was found that most teachers favor laying

emphasis upon content rather than method. They say that students are lamentably weak in a knowledge of the subject matter of geography. However, as normal schools are places where the theory of teaching is the chief aim, they are catering to that opinion against their will. A solution to the difficulty may lie in the plan that many normal schools are adopting or offering two courses, one in Primary Methods and one in Intermediate Methods, given by the supervisors of the respective departments of the training school. This relieves the regular teacher of geography of the methods work and allows him to devote his time to content. Geography as well as other subjects will benefit by the adoption of this plan.

Columns 8, 9, 10, 11, and 12 give the same information concerning electives as the previous columns gave concerning required subjects. It will be noted that most of the electives are offered only once during the year, thus eliminating the necessity of having a large number of teachers in one department.

Column 13 gives the total number of hours of the teachers' time devoted to geography throughout the year and indicates the importance which the institution attaches to geography or the paid hours which are devoted to it. It should not be interpreted as meaning that the schools which stand first in the column are leaders in the amount of geography offered.

Columns 14 and 15 are self-explanatory. In some cases the head teacher of geography is not the head of his department, for the work in geography is too often combined with that of other sciences and placed under a teacher who is not trained in the subject. This is as great a mistake as our universities are making when they combine geography with and subordinate it to geology. The number of teachers will in most cases indicate the enrollment of the various schools.

In conclusion it might be well to state the names of the various courses being offered. The nature of the courses was not shown by the letters but can be had by writing to any of the instructors.

Principles of Geography
World Geography or Continental Studies
Geography Methods

Geography of North America
Geography of South America
Geography of Europe
Geography of Africa
Geography of Oceania
Geography of The War
Geography of The Pacific Coast States
Current Geography
Physical Geography
Map Drawing
Practice Teaching
Commercial Geography
Conservation of Natural Resources

It is interesting to note that only three schools are giving courses in the geography of South America. This is surely a mistake, for we should emphasize the geography of those countries with which we are in the future to have the closest commercial and political relations. As regards Africa, probably little attention need be given to the continent as a whole, only parts being studied in detail. Courses in map drawing alone are evidently features of the past. Only one school reported a whole course devoted to it. This does not mean that map drawing has been dropped. It means that it does not receive the attention it previously received but is being combined with other courses. The conservation of natural resources is a course worthy of attention and in many parts of our country deserves greater emphasis.

The writer invites correspondence in order to determine whether a survey of geography in other schools—in the central and eastern parts of the country—is warranted.

OUR GEOGRAPHY CORRESPONDENCE

By JEHIEL S. DAVIS
High School, Prescott, Arizona

When we took up the study of Geography at the high school in Prescott, Arizona, we began at home. Here, where the county as large as New Jersey has only three high schools, quite a number of pupils come in to the school from distances of from a few miles to almost a hundred miles so that the class has a good first hand knowledge of the whole vicinity. Individually and as a class we made excursions from such as an afternoon field trip to Thumb Butte to a motorcycle trip through Salt River Valley to Roosevelt Dam and Tonto Cliff Dwellings National Monument. Some of us had been to the Grand Canyon National Park, others to the Petrified Forests National Monument or Montezuma Castle National Monument, so we compared notes and used each others post cards and kodak pictures in the balopticon. We drew plans and sketch maps and followed an outline organizing the information contributed by the different members of the classes into a whole. When this was done each member of the classes wrote a letter from his or her note book to a different high school in North America, Hawaii, or England. Perhaps the most interesting answers received were those from Honolulu, New Orleans, Ponce (Porto Rico), Umatilla (Oregon), and Moosejaw (Saskatchewan), though all of them were good. The following is a sample of the letters sent out and the answers received. Many of the letters including the one from Honolulu contained pictures which we used in the balopticon to illustrate the letters.

PRESCOTT, ARIZONA
PRESCOTT HIGH SCHOOL
April 4, 1919

GEOGRAPHY CLASS,
McKINLEY HIGH SCHOOL,
HONOLULU, H. I.

DEAR FRIENDS:

We are writing this in the hope that our Home Geography may be of interest and use to you, also hoping that you will send us back a similar letter giving us your Home Geography which we very much desire to obtain from you first hand.

Our little city is arranged in a rather irregular rectangle with the main roads leading out at each of the four corners. The one railroad enters and leaves at the north side because of the course of the washes it follows together with the arrangement of the mountains near the city. The town is built around a central plaza in which stands the county court house, in our estimation a very beautiful building.

Prescott stands at latitude 34° 33′ north which is about the same as Santa Barbara (California), Atlanta (Georgia), Fez (Morocco), Bagdad on the Tigris or Singan Fu, China. This is about 13° north of where you live. Our longitude is 112° 27′ west of Greenwich or about the same as Phoenix, Salt Lake City, and Lethbridge, Alberta and a little west of Hermosillo, Sonora, and Easter Island. This is about 44° east of you. Prescott is at an elevation of 5,346 feet and that is the reason it is often called the "Mile High City." We are about 4,000 feet higher than Phoenix the capital of Arizona which is only one hundred and eight miles south of here. We are about 1,000 feet higher than Salt Lake City and 1,200 feet lower than Mount Mitchell, North Carolina, the highest eastern peak. This altitude is one of the most important factors in our climate. Our high dry climate is the reason that Prescott is considered such a good health resort and that there are so many sanitariums, especially for tubercular people.

Before I tell you more about Prescott I shall explain a little about the country in which it is located so you will get a clear idea of this part of Arizona. Yavapai County (pronounced Yą̈'vą̈ pie) is in the west central part of the state. The name is Indian and French dialect for hill country, and that tells something of its physical character. It is about the size of the state of New Jersey or about a quarter larger than the area of the Hawaiian Islands.

The surface of Prescott is dominated by a wash which runs north through the central part of town and joins two branches one of which comes north through the east end and the other east through the northwest corner. Valleys open down to the east and north and there are mountains and hills in the other directions. The country around and in town is very rough although the relief is not great for a mountainous region. There are some rather strange rocky sections, places almost completely covered with large granite rocks in such irregular arrangement that it is impossible to walk across them in places. Sometimes these rocks form high hills but more often large piles.

We think Prescott has a delightful climate even though rather cold in winter. The absolute average temperature for the year is 52.7°, the average of the coldest month, January, is 35.1° and the warmest month, July, is 72.7°. The extreme temperatures are, absolute minimum —12° (below zero) and absolute maximum +104° while the average yearly minimum and maximum are +10° and +95°. It seems queer that with these cool temperatures we are only a hundred miles from the Salt River Valley

orange and cotton country. The difference, of course, is explained by the difference in altitude.

There is a great difference between our rainfall and yours, as we have a yearly average of only 17.4 inches. This fall is quite well distributed the months of highest average being August, 3.2 inches, July 2.85 inches and February 1.96 inches and those of least rain being June .24 inches, May .55 inches, and October .78 inches. Snowfall is included in the above, the months having most being February, then January. The average depth of snow fall is 30.2 inches. Much more is received in the mountains nearby and the linemen of the electric power company as well as many miners use snowshoes in the winter so that these are not at all a novelty in this part of Arizona as so many think.

The relative humidity is approximately 54%, the monthly minimum being 54% A. M. and 35% P. M., and maximum 86% A. M. and 85% P. M. This is higher than the humidity at Phoenix but of course much lower than that where you live. Here in Arizona we have much sunshine, in fact Prescott receives 86% of all possible. The winds are gentle and varied, with most from the southwest. The average air pressure is about 25 inches of mercury.

Our high altitude controls the forests through the rainfall and humidity. There is some irregularity due to direction of exposure but in general areas above 5,500 feet are forested while those below are desert like. Prescott stands in the edge of the forest. Much of the country round is covered with forests in which yellow pine is the most numerous though in no places are they cut for lumber in this county. Yellow pine is a very pretty tree, rather tall and slender, bearing long needles and I believe quite unlike any tree in your islands. Other native trees and plants are the wild black walnut, wild cherry, white oak, horehound, cascara, piñon and many other pines, cottonwood, mistletoe, and cacti. The most common cacti are the prickly pear, but it is not far to the giant saguaro and such other desert plants as the octillo and mesquite. The saguaro cactus often grows over thirty feet tall.

The wild animals are very different from those which you have. The bobcat, red fox, and coyote with the small animals such as rabbits and skunks are most common. Mountain lion and wild deer are quite numerous although they are too cunning to allow themselves to be seen often.

Agriculture is not extensively practiced in this vicinity for several reasons. Most important are the frosts which come as late as June and as early as September. It is so dry that after a good deal of experimenting with dry farming it is still undecided whether it is worth while or not. The land is so rough that much of it is useless except for grazing which is carried on extensively. Irrigation farming is successful but more common at lower elevations where there is a longer growing season. In a few years we hope to have many more farms. About five miles northeast of Prescott

is a small dam, Lake Watson Dam (90 feet high) which stores water for the alfalfa farms in a valley farther to the northeast. There are many small sheltered valleys which are planted in orchards, mostly apple, and some of the finest apples in the country are grown in them. Some good land is not used because it is too far from a railroad. There are very few railroads in Arizona.

The population of Prescott is about 6,000. That may seem very small to you as Honolulu is much larger. However it is not so small as compared with other Arizona cities. Among the people living here there are a few of the native Indians left. Most of them were shipped away to Florida or killed. There are also a number of foreigners, mostly Mexicans.

The one railroad that I have mentioned as passing through here is a branch of the Santa Fé. It leaves the main line at Ash Fork, 65 miles north of here and continues by a roundabout way to Phoenix. The way to come here from Honolulu would be to take a steamer to San Francisco or Los Angeles and come by Santa Fé through Barstow and Parker to Phoenix where you would change to come here. There are two main automobile routes between here and Phoenix, one following the general course of the railroad and the other going direct through the Black Canyon and being 45 miles shorter. A road goes north to Ash Fork and connects with the transcontinental highway, the National Old Trails Road. The Borderland Trail and Apache Trail go through Phoenix.

The most important industries of the region are mining and cattle grazing, but that of Prescott is the Santa Fé shops. The cattle industry and the rodeo have been made famous by Harold Bell Wright's book "When a Man's a Man" and by the advertising of the Frontier Days celebration held for several days including the 4th of July. Copper and gold are the leading minerals taken out in the region.

We have many points of interest in the vicinity. The greatest of all is the Grand Canyon of the Colorado, in the northern part of the state, now a national park and not only famous for its almost inconceivable size but for its wonderful beauty and coloring. Every year it is visited by thousands of tourists from all parts of the world. Many ride down the winding trail on burros to the edge of the Colorado River over 5,000 feet below. The Petrified Forests National Monument northeast of here is also of great interest with its agatized trees. Some distance east of Prescott is the Montezuma Castle National Monument and Well, ruins of a prehistoric people, as is also Tonto National Monument and Casa Grande Ruin National Park to the south and southeast. Near Tonto is the Roosevelt Dam which stores water to irrigate 189,000 acres of land in the Salt River Valley around Phoenix. It stands 285 feet high and 1,070 feet long and holds back water making a lake 25.5 square miles in area. Walnut Canyon National Monument to the north east of Montezuma Castle is also of interest for cliff ruins. There are Indian inscriptions on the rocks in several

places, one within easy walk of Prescott. Navajo National Monument to the northeast and Tumacacori National Monument to the south are set aside to preserve interesting Indian relics as is also Papago-Saguaro National Monument in the Salt River Valley in part. This last reserve is also as the name indicates to preserve the giant cactus which grows there among wonderful red rocks and hills. Granite Dells is a tiny valley among great granite boulders near Prescott where an attractive little artificial lake has been built for bathing purposes. Four miles west of town is Thumb Butte, a small but picturesque volcanic neck which rises a little over a thousand feet above town.

We think we have very good schools in Arizona although there are not many and they are not large. In Prescott we have two grade schools and one high school, also a Catholic Academy and a Business College. Our high school has about one hundred students but is as well equipped as most any school in the country according to people who are familiar with schools in various states. There are a number of churches in Prescott including the Congregational, Episcopal, Methodist, Christian Science, and Catholic. The most attractive building is the court house built of local granite although the schools are not far behind and we have a nice library building and railway station. The beautiful Pioneers' Home stands on a rocky hill overlooking the city and just out of town is the nice but small county poor farm.

As school closes in the latter part of June we hope you will answer in time so that we may receive it before then.

Sincerely,
PRESCOTT HIGH SCHOOL SCIENCE CLASS,
MARGARET HILL

McKINLEY HIGH SCHOOL
HONOLULU H. I.
April 22, 1919.

MY DEAR MAINLAND FRIENDS:

Your letter to the Science classes of our high school was very interesting. My classmates appreciated it very much because it contained a great deal of information concerning your city which in the long run will help us in our studies and perhaps in our travels.

Our islands are lying between latitude 18° 55′ and 23° north and longitude 154° 40′ and 162° west. Honolulu on Oahu is the chief city of the group. It has a fine harbor and is a stopping point for nearly every steamship line that has its route in the Pacific Ocean. A steamer comes in or sails out with freight and passengers on an average of three a day, not including our inter-island boats.

Our business section is just a few blocks from the wharves so you can see that the first thing a tourist approaches when he visits us is the business

section. Among the business houses are two big newspaper firms, namely The Pacific Commercial Advertiser, a morning paper published every day and the Honolulu Star Bulletin, an evening paper published every day except Sunday. Besides these there are several oriental papers. There are about eight banks and many theaters in the city.

The population in the city alone is about 75,000 which consists of different nationalities, chiefly Chinese, Japanese, and Portugese.

The climate is temperate and plant life is green all the year round. The most important industries are agriculture and commerce. Our chief food products are sugar cane, pineapple, rice, taro, and bananas. There are others such as coffee, coconuts, bread fruit, mangoes, and guavas which grow wild on the mountains. Our sugar plantations are scattered all over the island. One of them is situated a few miles from the business center of Honolulu. Others are found at Ewa, Waipahu, Waianae, Kahuku, and Waimanalo. Sisal and cotton are also grown within the city limits.

The town is well supplied with parks, has good water and sewer systems (water coming from reservoirs and artesian wells), a well equipped fire department, a fine electric car service to every part of the city and is lighted with electricity and gas.

We have among our public buildings a library, a museum, a post office, and a capitol building. We have many good roads and fine residences. We also have several large hotels and fine automobile rent service.

The mountains of Oahu are very low, the highest peak having an elevation of only a little over 4,000 feet. Our mountains consist of two long ranges both running from north to south, one on each side. A few wild goats may be found on these mountains.

The tourist visiting here can take an automobile to the museum where he can see many relics of our natives or he could visit several other places of interest such as the Aquarium, the Zoo, Waikiki, Moanalua, the Pali, and Tantalus. At the Aquarium are fish having all the colors of the rainbow. After visiting the Aquarium you can either visit the animals of the zoo or take a dip or ride a surf board in the ocean at the beach of Waikiki. Moanalua has many beautiful private gardens which are open to the public. At the Pali, famous in the history of King Kamahamaha, you can get a fine view of the other side of the island. Tantalus is a low mountain about 2,000 feet high from which you have a full view of the city by itself and the fine blue ocean surrounding it. If you come to Honolulu sometime in the future don't fail to take a trip around the island because along the way there are many things worth seeing.

Our government resembles yours which includes a governor, secretary, auditor, judges, superintendents of public works and education, treasurer, commissioner of public lands, etc. In connection with the above the federal government maintains a judge, a district attorney, a marshal, and a collector of customs and internal revenues.

Education is free, compulsory and universal in our city. The Department of Public Instruction has at its head a superintendent and several commissioners. There are many grammar schools here with grades as far as the eighth. There is also a Normal Training School from which the schools are supplied with teachers. The McKinley High School is the only public high school in Honolulu although there are several private schools which give a course practically the same. The faculty consists of about thirty teachers with a student body of over 500. Our school is overflowing and a new high school is to be built within a short time (money already appropriated by the legislature). The present building is to become a grade school.

Thanking you very much for writing to us, I remain,

Sincerely yours,
YUN FAT LEE

SHANTUNG

The plains of eastern China, with a fertile soil, easily tilled, and the warm, rainy summers of a monsoon climate, are among the most productive regions of the earth. From ancient times their productivity has been put to the service of man and has supported him in vast numbers. Travelers from the scantily peopled medieval Europe were astounded by the swarming life of Cathay. On page after page of his book Marco Polo tells how he traveled through a succession of "rich and noble" cities. Today the Chinese plains remain one of the very densely populated parts of the world.

Rising island-like of the Chinese plains and projecting for out into the Yellow Sea towards Korea is the rocky peninsula of Shantung. The peninsula, indeed, formerly was an island: alluvial deposits of the Yellow River (Hwang-ho) have joined it to the mainland. The rocky peninsula with a bordering belt of alluvial plain on the west constitutes the province of Shantung.

THE CRADLE OF CHINESE CIVILIZATION

The Chinese people originally came from the west. They traveled down the valley of the Yellow River and settled in Shantung, the name of which signifies "Eastern Mountains." Because

their peculiar genius was developed here in particular, Shantung is sometimes termed the "cradle of Chinese civilization." Here, according to tradition, was originated the basis of this civilization, old in the world's history. At the western edge of the mountains rises the sacred peak of Tai Shan. Out from the waters of the Yellow River on the plain below, as the legend runs, came the dragon that imparted to the Emperor the secret of successful husbandry. This secret was cultivation by the use of the muddy waters of the river for irrigation. Hence the dragon became the imperial emblem nearly 5,000 years ago. Hundreds of years later —in the sixth century B. C.—a new sanctity was gained by the mountain. Near its foot was born China's greatest sage, Confucius, and on its summit he was buried. His shrine is a place of pilgrimage. During February and March, when most pilgrimages are made, it is said that as many as 10,000 people make the ascent of the mountain in a single day (1). Northeast of Tai Shan, on the Yellow River, is Tsinanfu, capital of the province and reputed to be the oldest city of China, though the earliest site is now buried beneath the river silt.

THE PEOPLE OF SHANTUNG

This historic province is peopled by a stalwart and vigorous folk, numerically very considerable. It is impossible to give the exact population, for no complete and adequate census, as we understand it, has ever been taken in China. Estimates range from something below 30,000,000 to nearly 40,000,000 for an area of 56,000 square miles (about the size of Wisconsin). Even if the lower estimates be taken, this means that there are over 500 people to the square mile; fewer, of course, in the mountainous parts, many more on the plains. This high density is too much even for the industrious and frugal Chinaman. There are many emigrants from Shantung. Its people may be seen in distant places—working in the Siberian gold mines, the Manchurian grain fields, or on the Trans-Siberian railway, and we have lately heard a good deal about the Chinese coolie behind the battle lines in France.

FLOOD AND DROUGHT

Emigration especially takes place after the periodic disasters to which the province is subjected. The alluvial plains are won-

derfully fertile, but they are in constant danger of flood. The Yellow River, "China's Sorrow," is perhaps more notorious in this respect than any other river in the world. It has continually changed its course, at times making changes of great magnitude. The river now enters the Gulf of Chi-li to the north of the province; seventy years ago it emptied to the south, a space of nearly 300 miles from the present mouth. In 1851 it broke its banks and two years later was flowing in the present course, which was one it had followed six centuries before.

Much of the hill country of Shantung is bare and barren, and here the greatest danger to be feared is failure of the rains. Shantung (Tsingtao) has an average rainfall of barely 25 inches a year, though fortunately more than half falls in the summer months, June to August. A single bad year brings the people flocking in hundreds to the towns and villages seeking charity(2).

RESOURCES

Shantung produces "every kind of grain and vegetable." Wheat, barley, millet, sweet potatoes, soy bean, peanuts are the principal crops. On the inundation lands of the Yellow River valley many cattle are raised, and large numbers are exported from the province. In the past the name Shantung has been more familiar to most of us as the name of a silken fabric rather than as the home of some 30,000,000 people. This fact bears witness, however, to the commercial importance of Shantung as the home of the silk industry and as the means of support of a considerable number of its inhabitants. Exploitation of its vast stores of coal and of its iron ore of excellent quality has already begun, and the province is known to be rich in other minerals.

FOREIGN RELATIONS OF CHINA

The wealth of Shantung is repeated in other Chinese provinces. The great country as a whole is a reservoir of actual and potential wealth. China is a productive land now, but its possibilities are much greater than its present production. Its peaceful, conservative people have been living for hundreds of years in a backwater. During the last hundred years or less the nations of the western world have entered on a new era of industry and trade which has called for world-wide search for the extension of markets and for

sources of raw materials. China, so long a closed country, has been compelled to grant the commercial nations leases and concessions for the exploitation of the wealth that she has left undeveloped. Naturally this has led to a threatened application of the "Spheres of Influence" policy that has already partitioned Africa. It was fear of this threat that led to the Boxer rising of 1900, and it is significant that the rising commenced in Shantung whose people are so proud of their honorable ancestry. In regard to foreign relations Shantung holds a position of special strategic importance.

THE STRATEGIC POSITION OF SHANTUNG

Shortly before the Boxer rising Germany had obtained a foothold in Shantung. In compensation for the murder of two German missionaries in 1897 she obtained a 99-year lease of a territory of some 200 square miles about Kiaochow Bay and certain concessions for exploiting the province. These included the right to build a railroad from Kiaochow to Tsinanfu with later extensions and rights for the development of mining properties about the railroad. Even before the war the value of concessions and lease had been proved (3).

Three great traffic routes run through the eastern lowlands of China from north to south. The Grand Canal, one of China's great native engineering feats, runs from Tientsin to Hangchow (at the head of Hangchow Bay, south of Shanghai), about 1,000 miles. The canal was begun in the sixth century B. C. and finished in the thirteenth century A. D., about the time of the visit of Marco Polo, who describes the great grain trade on the canal. At present the canal is fallen into disrepair, and the trade on it is only a small part of what it might be. An American company, however, is negotiating for reconstruction. Then there are the two railroad lines, that from Pekin to Pukow on the Yangtsekiang with connection to Shanghai and that from Pekin to Hankow farther up the Yangtse and one of the chief interior marts of China. Let us consider these routes in reference to Kiaochow.

Kiaochow is the finest natural harbor of China. Tsingtao, at the entrance, is a deep-water, ice-free port, improved by Germany by the addition of modern port facilities. Railroad connection was all that was needed to draw trade to the port.

Now the transverse railroad from Tsingtao to Tsinanfu, with its proposed westward extension, is in the position to tap all three longitudinal routes. It penetrates to the heart of productive China. Already the influence of the Tsingtao line has been felt in the diversion of trade—in straw braid, for instance—not only from former flourishing ports of Shantung but as far away as Tientsin to the north and Shanghai, 300 miles away, to the south. Extension of the line will greatly increase this influence. Whoever controls the port and the railroad will control a large share of the Chinese trade. At present Japan is in this position, a situation the more significant in view of Japan's position in Korea and Manchuria (Liaotung Peninsula).

Shortly after the outbreak of war Germany capitulated her rights in Shantung to Japan. Japan has since been operating the railroad and mines; she has built a new city on the lowland of the inner harbor of Tsingtao, and many Japanese have entered the country. Japan has promised the restoration of Kiaochow to China: how this promise will be carried out remains to be seen.

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(2) F. H. King: Farmers of Forty Centuries, Madison, Wis., 1911. See Chapter 10, "In the Shantung Province," pp. 216-260.

(3) *Kiau-Chau, Journ. of Geogr.*, Vol. 13, 1914-1915, pp. 119-120.

NOVEL SHIPS: LUMBER RAFTS THAT CROSS THE SEAS

The accompanying illustration shows an experiment in a novel form of transportation—the rafting of lumber across the sea. The raft, built of sawn timber on the Trondhjem Fiord, was towed by tug across the North Sea to an English port. During the journey, which took 28 days, a severe storm was encountered. The raft, however, weathered it without difficulty, and the timber arrived in good condition for the most part *(Weekly Bulletin,* Dept. of Trade and Commerce, Ottawa, Canada, Sept. 22, 1919, pp. 570-574).

The success of this experiment is particularly gratifying in view of the present demand for timber in England. Not only are the needs great, but the home forests have been extensively sacrificed for war emergencies. In France the case is still worse. These countries look especially to the vast forests of northern Europe for their supply. It is estimated that in the Gulf of Finland there were at the beginning of 1919 no less than three billion feet of

Timber raft at Trondhjem, Norway, ready for transportation across the North Sea to an English port. The raft measures 360 feet in length, 42 feet in beam and 18 feet in depth. (Photograph reproduced by permission from *Weekly Bulletin*, Dept. of Trade and Commerce, Ottawa, Canada, Sept. 22, 1919.)

lumber awaiting transport. If shipped in the ordinary way this would require 2,100 steamship voyages.

Other types of timber ships are also in use or under construction *(Weekly Bulletin,* Dept. of Trade and Commerce, Ottawa, Canada, June 23, 1919, pp. 1158-1163). At Port Rupert, British Columbia, there is being built a raft designed to sail for England via the Panama Canal, under its own power. It will comprise 2,000,000 feet of lumber and will be fitted with sails and engines which, when the raft is demolished, can be returned for use over again. If this more ambitious scheme proves successful it will open up great possibilities to a country so rich in timber as British Columbia.

Already log rafts have successfully navigated the Pacific Coast. Rafts 900 feet long and containing 4,000,000 feet of timber, built on the Columbia River, have made the 1,200 mile voyage to San Diego, California, in approximately 15 days.

THREE FRENCH FAIRS

This last spring three big fairs have been held in France—in Paris, Lyons and Bordeaux (*Commerce Reports,* March 17, 1919, p. 1267). They represent the newest development of an old form of trade. The fair was a great institution in medieval Europe. In those days of slow and insecure travel distribution was difficult. An annual gathering at some conveniently situated central point was the way in which people and goods, buyers and sellers from a distance, were brought together. The fair was also distinctly social in character. As transportation improved the fair tended to disappear. In some cases, however, the fair survived by becoming adapted to the changing conditions; such is the case with the famous fair of Leipzig, which became a fair of "samples." The hereditary business and the central location of Leipzig also made it a great international market for such goods as furs and leather, which cannot be purchased by sample but must be inspected.

Partly to supersede the Leipzig fair, partly as a new commercial movement, France initiated the fair of Lyons in 1916. The fair is officially described as "neither an exhibition nor a market . . . not so much the display and sale of goods as the bringing together of actual manufacturers and buyers." Success of the first fair led to the establishment of others in Paris and Bordeaux. The three fairs, however, are as distinctly different in function as are the three cities in which they are held. The Lyons fair is primarily international, that of Paris national, that of Bordeaux colonial.

No city has had so profound an influence on national development as Paris, largely because of its situation. Roads from the rest of France, and hence from the outside, converge on the Paris Basin. It is interesting to note that what is reputed to be the oldest fair of Europe was held in Paris, the fair of St. Denis, flourishing before the time of Charlemagne.

Where Paris is a true national center, Lyons in the Rhone corridor, highway between the Mediterranean and western and northern Europe, is rather a point of international transit. Today Lyons is a great local center and seat of industry, but its prosperity

is also bound up with its relations with foreign countries, some of them remote, Great Britain, United States, Italy, the East, and the Far East.

Bordeaux on the other hand has well-established colonial traditions. Today approximately one-third of the goods bought for and imported into the French colonies and products exported therefrom are handled by Bordeaux firms and shipped via Bordeaux.

GEOGRAPHY IN RECENT SCHOOL SURVEYS

Geography in Recent School Surveys by Robert M. Brown (*Educational Review,* New York, Oct., 1919, pp. 207-221) is a parallel study with the author's Geography in Recent Books on Education (*Journ. of Geogr.,* Oct., 1919, pp. 268-274). In most recent school survey reports geography teaching has received unfavorable criticism. It is therefore a peculiar pleasure to read the highly favorable commentary on the teaching of geography in the St. Louis schools (Survey of the St. Louis Schools, World Book Company, Yonkers-on-Hudson, 1918), where it is asserted that the subject appears to the critic "to be more generally well-taught than perhaps any other subject in the grammar grades." Here, apparently, is avoided that catechistic use—or misuse—of the textbook whereby teaching drops into formal lines and the narrow methods of drill. Lessons furthermore escape the frequent criticism of geography work, that it is cut and dried; supplementary material is freely used. In this connection and regarding the question of supplementary readers Mr. Brown quotes the comment of one critic, that it would be well to drop use of this term as applied to reading for the so-called "supplementary" reading should be the basic geographic experience.

The critic of the St. Louis schools further remarks another welcome sign of progress in that little dependence is placed on formal methods though there is some unwillingness to break away from the appearance of the traditional outline.

> I noticed frequently, on the board, the conventional list of geography topics—location, boundaries, surfaces, etc. In no case did I happen to hear a recitation based on these topics and I mention them only to call

attention to the fact that they are a survival of the disconnected memoriter kind of geography.

In urging departure from these old conventional lines Mr. Brown points out a pertinent fact concerning geography teaching —the need to keep abreast with the ever-changing relations that enter into the content of geography:

> In a field of study where changing conditions are important and shifting values a chief characteristic, the teacher should be in a position and in a frame of mind to weigh the importance of the new, to make use of available sources of information and to discriminate in her teaching between transitory and stable states.

COOPERATION AS AN AID IN GEOGRAPHICAL INSTRUCTION

Every now and then the ordinary progress of instruction in the class room is enlivened by the introduction of some feature out of the common. Perhaps your pupils have raised some question of unique and peculiar interest, provoking a new line of thought or research. Perhaps you have discovered some new illustration of unusual geographical quality, or have originated some geographical appliance, simple, maybe, but inexpensive and effective. You may render a great service to your fellow workers by putting such experiences at their disposal and this you may do with little trouble through the medium of the *Journal of Geography*. The editor welcomes the receipt of short practical items dealing with actual happenings in the class room. Such material will be put on file and selections from it published in the *Journal*.

CONCERNING A GEOGRAPHY CLUB

Almost every day the editor receives letters asking for suggestions and advice in matters of school geography. A correspondent from Texas has recently written for information on the organization of a geography club among first year normal students. Teachers who have already conducted successful clubs of this or related type are specially invited to send to the editor accounts of their experiences.

AN OPPORTUNITY FOR GEOGRAPHICAL EXCHANGE

With the approval of the Department of State and the United States Bureau of Education, and the co-operation of the French Ministry of Education there has been established a National Bureau of French-American Correspondence *(School and Society,* Sept. 27, 1919, p. 377). The intention is to promote correspondence between pupils in France who are studying English and pupils in America who are studying French. The linguistic aim, however, is not the only educational end in view. The movement presents an opportunity for the teacher of geography.

Along with the letters, there will be a fine exchange of historical, artistic, geographical, manufactural, commercial and home-life material and information, clippings, picture postals, kodak views, etc., leadings up to the deepest exchanges of human sympathies and ideals, that will reinforce international good will.

The bureau has its headquarters at the George Peabody College, Nashville, Tenn., whence information may be obtained.

CORRESPONDENCE

The Editor welcomes suggestions and discussions on matters regarding the *Journal.*

To the Editor of the Journal of Geography.

The May number of the *Journal of Geography* reached me too late for reply to Professor W. M. Davis's interesting and emphatic letter before the Summer break in the issues took place and since June an absence in Belgium, a Summer School in Wales and a batch of examination papers have caused me to get seriously in arrears with many things. On the other hand, the 1,500 or more examination papers have yielded interesting support to the points I raised in my September, 1918, article in the *Scottish Geographical Magazine,* reprinted in the March number of the *Journal.*

It is possible that there is some misunderstanding with regard to this article. It was written for British teachers and possibly many of the criticisms do not hold good in America, in fact from recent conversations with American soldiers over here I should say that the map means more to a seventh grade boy in America than to a sixth standard boy in Britain and my article was chiefly that—a plea for more frequent and better handling of the map.

Professor Davis challenges me with a venturesome generalization when I say that "Geometry, Climatology, Geology, Geomorphology are none of

them Geography." Personally I thought that the statement was more of an accepted axiom than a hasty generalization and even Professor Davis refers in his next sentence to climatology as being but a *part* of geography—but surely geography consists of much more than extracts from the above sciences [see The Circumference of Geography, *Journal of Geography,* April, 1919]. Professor Davis then goes on to speak of the truly geographical nature of climatology when well taught (p. 198). This is not a difference of opinion between us. I believe I was taught climatology badly. I am certain that I taught it badly in my early days but I have since realized its value and *difficulty* as a part of the data used by geographers. Might I be allowed to call attention to my booklet "Suggestions for a course in Climatology in correlation with Geography" published August, 1914. Sir Napier Shaw in his preface to this booklet rather criticises the author as being "very liberal in his interpretation of the scope of climatology"; but even then I never claimed more for the subject than that it should contribute materially to a course in geography.

Professor Davis's other criticism is in connection with my remarks on geomorphology. He evidently imagines that I pay too little attention to the teaching of land forms as a part of physical geography, which he rightly maintains is the foundation of geography. I am pleased to have that paragraph to lay before my friends here. As the teacher responsible for physical geography at the University College of Wales, Aberystwyth, I have occasionally to meet a charge in the opposite direction and my "Handbook to the Relief Model of Wales" published 1915 is held up in judgment against me. In that I am assured that my descriptions of any area consists of about 75% material under such headings as Geology, Relief, Coastline, Glaciation and about 25% labelled Human Geography.

These are Prof. Davis's criticisms but in reality they are small side issues to my main argument.

It is becoming increasingly difficult to define geography but it is becoming increasingly easy for pupils to gain advanced certificates in the subject and yet know little or nothing of the position of places of which they write and talk so glibly.

It is merely a personal expression of opinion but I regret that in Britain, there is a tendency for our subject to degenerate into chatty little descriptions (?) of lives and wives in other (unplaced) lands for the small fry and a medley of unrelated smatterings of natural science, physical science and history for the advanced pupils with little or no use of the map as a means of unification.

No doubt American school geography is satisfactory—I have no personal experience of it; but Dr. Fairbanks's article (May, 1919) *Journal of Geography* proved interesting to me. Doubtless American higher grade pupils would find no difficulty in reading the excellent and stimulating Physiographic Bulletin No. 1 (May, 1918) of the National Highways Association but in Britain we have nothing like that; nor have we anything to

approach Salisbury and Atwood's "Interpretation of Topographic Maps" which I refer to on page 108 of my article where I suggest work dealing with shapes and characteristics of land forms and this without contradicting earlier expressed opinions. It is all a question of method of treatment. But I do ask that place geography shall not be dropped. I like Professor Goode's remarks in the April number of the *Journal of Geography* (page 182) relative to this "sailor geography" and particularly his remark that the Ukraine was considered to be a breakfast food. There is my point, our geography for all grades (in Britain) must consist of more than place names and place positions but it *must* include some of these (page 100) and it must include an extended and more scientific use of maps (page 102).

WALLACE E. WHITEHOUSE

Aberystwyth, Sept. 12, 1919.

NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

The next meeting of the National Council will be held in St. Louis in connection with the American Association for the Advancement of Science and the Association of American Geographers, during the week of December 29 to January 3, inclusive.

The presidential address by Dr. Brigham will be on "The Teaching of Geography and the War." Professor Sumner W. Cushing, chairman of a committee on "Normal School Geography," and Dr. Albert P. Brigham, chairman of a committee on "Secondary and Elementary School Geography," will make their reports. The remainder of the program will emphasize the teaching of regional geography. Details will be given in the December number of the *Journal*.

These meetings offer a splendid opportunity for every teacher of geography to secure something well worth while. Will you plan to be present? If further information is desired, address the Secretary.

GEORGE J. MILLER, *Secretary*,
State Normal School, Mankato, Minn.

GEOGRAPHICAL PUBLICATIONS

MATERIAL FOR THE GEOGRAPHY OF THE UNITED STATES

Publications of the State Geological Surveys frequently contain a limited geographical content. Among recently issued reports, however, we note below three whose entire content is related to geography.

The Geography of Maryland. By W. B. Clark, Maryland Geol. Surv., Vol. 10, 1918, pp. 41-167. Johns Hopkins Press, Baltimore, 1918.

A summary of this geography is already in use as a state supplement and the amplified form here given has also been made available to the

teachers of the state through the school libraries. The customary topics are treated and there is a section "Suggestions for physiographic and geologic excursions." Human relationships are dealt with in the discussion of the three major physiographic provinces in which the state falls. The illustrations are excellent. Alone they give an admirable survey of the state and many might well serve as type illustrations, for example that of a sand spit (p. 73).

The Geography of Oklahoma. By L. C. Snider. Oklahoma Geol. Surv., Bull. 27, pp. 325, Norman, 1917.

"Not a text book, but a guide to supplement the study of geography and geology, and biological science in the schools of our State, as well as to serve the needs of the general public." As the introduction thus states the report is a *source* of material for geographical study. In form it is encyclopedic and as such represents the collection of a vast amount of data, heretofore not readily accessible.

The Geography of South Dakota. By S. S. Visher. South Dakota State Geological and Natural History Survey, Bull. 8, pp. 189, Vermilion, 1918.

A comprehensive and detailed study accompanied by an extensive bibliography. Particular note may be made of the chapters on biogeography, a subject on which the author is specially well equipped to write and which is treated in unusual detail, and that on human geography. The latter is dealt with on interesting lines. The topics in order of sequence are (A) Present conditions—population and its composition; distribution of population, location of dwellings, location of towns; the more important occupations. (B) Historical geography or evolution of present conditions—geography of exploration, of the fur trade, of river commerce; settlement (traced by successive epochs).

A GEOGRAPHIC NEWS BULLETIN SERVICE

Through its bi-monthly publication *School Life*, the Bureau of Education, Washington, D. C., announces the establishment of a geographic news service for teachers. Bulletins, prepared by the National Geographic Society, for the use of schools will be issued every day except Sunday, and the set of six will be sent weekly to schools upon written request to the Bureau. Teachers may apply individually; principals may apply for copies necessary for teachers (not for individual pupils) and for their school library. School superintendents desiring copies for their entire teaching force should correspond with the Bureau as to methods of sending the bulletins in quantities.